3. A device as claimed in claim 1 in which the dielectric body extends from the antenna a distance determined in accordance with the major dimension (L) of the antenna in the dielectric.

4. A device as claimed in claim 1 in which the dielectric body extends from the antenna a distance at least substantially equal to $2L^2/\lambda$, where L is the major dimension of the antenna and λ is the wavelength of the radiation in the dielectric.

5. A device as claimed in claim 1 in which the dielectric body comprises a substantially cylindrical portion with the antenna extending axially at its centre a distance L.

6. A device as claimed in claim 2 in which the dielectric body extends from the antenna a distance substantially equal to half the wavelength of said radiation in the dielectric.

7. A device as claimed in claim 1 in which the dielectric body is such that it has a dielectric constant at its core which is higher than the dielectric constant at its outer periphery, the latter being more closely matched to that of said living tissue.

8. A device as claimed in claim 7 in which the dielectric body comprises an inner core and an outer layer, each of a different dielectric constant.

9. A device as claimed in claim 8 in which the inner core and outer layer have those dimensions that extend from the antenna determined in accordance with the dielectric constant of each so that the overall dimension is a predetermined fraction of the nominal wavelength of the radiation in the dielectric.

10. A device as claimed in claim 9 in which the inner core and outer layer each have a dimension substantially equal to a quarter of the wavelength of radiation therein.

11. A device as claimed in claim 8 in which the outer layer is formed with indentations in its outer surface which serve to reduce the dielectric constant in this region when the indentations are filled with other matter.

12. A device as claimed in claim 7 in which the dielectric constant of the dielectric body varies continuously over at least a part of the distance from the antenna.

13. A device as claimed in claim 1 which has a tip portion that extends beyond the end of the antenna.

14. A device as claimed in claim 13 in which the tip portion is pointed to assist penetration of biological matter.

15. A device as claimed in claim 14 in which the tip portion is composed of a different material to the dielectric body.

16. A device as claimed in claim 13 in which the tip portion is an extension of the dielectric body and is rounded so as to support forward transmission of radiation.

17. A device as claimed in claim 16 in which the tip portion is substantially hemispherical.

18. A device as claimed in claim 17 in which the tip portion has a radius substantially equal to half the wavelength of the radiation in the dielectric.

19. A device as claimed in claim 1 in which the elongate device comprises a coaxial conductor with a central conductor that projects beyond outer screening of the coaxial conductor at the distal end to form the antenna.

20. A device as claimed in claim 19 in which the antenna has a length substantially equal to half the wavelength of the radiation in the dielectric.

21. A device as claimed in claim 19 including a transformer between the coaxial conductor and the dielectric body to reduce reflection of radiation back into the coaxial conductor at the boundary with the dielectric body.

22. A device as claimed in claim 21 in which the transformer includes a space within the coaxial conductor into which packing of the coaxial conductor can expand.

23. An elongate device for insertion into a living body, the device having antenna at its tip for coupling radiation into biological matter and a dielectric body surrounding the antenna so as to enhance transmission of radiation in the forward direction.

24. A device as claimed in claim 23 in which the dielectric body has a rounded tip portion that extends beyond the end of the antenna to support forward transmission of radiation reflected internally from the outer surface of the dielectric body.

25. A device as claimed in claim 24 in which the tip portion is substantially hemispherical.

26. A device as claimed in claim 25 in which the tip portion has a radius substantially equal to half the wavelength of the radiation in the dielectric.

27. A device as claimed in claim 23 in which the antenna extends a distance substantially equal to half the wavelength of said radiation in the dielectric.

28. A device as claimed in claim 23 in which the dielectric body comprises a substantially cylindrical portion with the antenna means extending axially at its centre.

29. A device as claimed in claim 23 in which the dielectric body extends from the antenna a distance substantially equal to half a wavelength of the radiation in the dielectric body.

30. A method of coupling radiation into biological material, the radiation being generated by an applicator comprising an antenna surrounded by a dielectric body, comprising the steps of selecting the dielectric constant of the body in accordance with the wavelength of the radiation in the dielectric so that substantially the whole of the near-field of the radiation is encompassed by the dielectric body.

31. A method as claimed in claim 30 in which the dielectric constant of the body is further selected in accordance with the major dimension of the antenna.

32. A method as claimed in claim 30 in which the dielectric body extends from the antenna a distance at least substantially equal to $2L^2/\lambda$, where L is the major dimension of the antenna and λ is the wavelength of the radiation in the dielectric.

33. A method as claimed in claim 30 in which the major dimension of the antenna is its length, which is substantially equal to half a wavelength of the radiation in the dielectric.

34. A method as claimed in claim 30 in which the dielectric body is located in relation to the biological material so that the far-field radiation lies within the biological material.

35. A method as claimed in claim 30 in which the dielectric constant of the body is high, but is lower than that of the biological material.

36. A method as claimed in claim 30 in which the dielectric constant of the dielectric body varies, and is higher at its core than its outer periphery, and the dielectric constant at its outer periphery is lower than that of the surrounding biological matter.

37. A method as claimed in claim 35 in which the dielectric constant at the core is greater than the dielectric constant of the biological matter.

38. A method of coupling radiation into biological material, the radiation being generated by an elongate applicator comprising an antenna surrounded by a dielectric body, the dielectric body being configured so as to enhance transmission of the radiation in the forward direction along the elongate axis of the applicator.

39. A method as claimed in claim 38 in which radiation is partially reflected internally of the dielectric body so as to be transmitted in the forward direction.

40. A method as claimed in claim 39 in which the dielectric constant of the body is high but is lower than that of the biological material.

41. A method as claimed in claim 38 in which the dielectric body has a substantially hemispherical tip portion with a radius substantially equal to half the wavelength of the radiation in the dielectric.

42. A method as claimed in claim 38 in which the antenna has a length substantially equal to half the wavelength of the radiation in the dielectric.

43. A method as claimed in claim 38 in which the dielectric body extends from the antenna a distance substantially equal to half the wavelength of the radiation in the dielectric.

The Commissioner is authorized to change any fee or credit any overpayment in connection with this communication to our Deposit Account No. 50-0852. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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